

REMARKS

This amendment should be entered since it places the application in condition for allowance and/or reduces the issues on appeal.

Applicant's attorney thanks the Examiner for the courteous telephone interview granted in this application on October 29, 2009. As summarized below, the claims have been amended as discussed during the interview to overcome the rejection under 35 USC 112, second paragraph, and to better distinguish over the prior art.

Claim 14 has been amended to delete the objected-to comparative language. Claim 15 has been cancelled since it also contained objected-to comparative language.

Claim 4 has been amended to include the subject matter of claim 6 which directly depended from claim 4. Subject matter similar to that in claim 6 is already contained in claim 14.

As indicated above, claim 4 now provides that the consolidation means include fluid impingement of the mat which cooperates with the lesser air-permeability of the first movable conveying element to enhance filament entanglement, consolidation and preservation of the ratio of the tensile strength in the length direction to the

tensile strength in the breadth direction. Similar limitations are contained in claim 14.

The matters raised in the Office action are discussed below in the same order as presented by the Examiner.

As also discussed during the interview, it is requested that the Examiner reconsider the improvements achieved by the claimed apparatus as demonstrated in the previously submitted Declaration of Emilie Pleyber. The demonstration of improved mats or processed filaments properties resulting from the use of the claimed apparatus evidences the patentability of the apparatus. That is, the apparatus is used to make the mat; the improvements in the mat result from the claimed novel features of the apparatus and therefore are indicative of improvements in the apparatus.

The rejection of claims 14 - 16 under 35 USC 112, second paragraph, is overcome by deletion of the objected-to comparative language from claim 14 and the cancellation of claim 15 which contained similar language. In view of the cancellation of claim 15, claim 16 is also cancelled so that no different combinations of claim limitations and new issues arise.

The rejection of the claims under 35 USC 103(a) as being unpatentable over US 2002/0168910 to Vuillaume et al.

("Vuillaume") in view of US 5768756 to Noelle ("Noelle") is in error and/or overcome by amendment. The combined references do not teach or suggest the invention as now set forth in the claims.

None of the cited patents, alone or in combination, teach or suggest the claimed apparatus including:

- a spun-bonding tower for depositing a mat on a first conveyor;

- transfer means to transfer the mat to a first movable conveying element for supporting the mat during consolidation, the mat being free of prior consolidation;

- the transfer means including "a second movable conveying element having a device for the application of a vacuum which maintains the mat on an outer surface of the second movable conveying element";

- consolidation means including fluid impingement to consolidate the mat while it is supported on the first movable element;

and wherein

- the first conveyor is more air-permeable than the first movable conveying element "to improve filament entanglement" ... "and to thereby enhance consolidation and preservation of the ratio of the tensile strength in the

length direction to the tensile strength in the breadth direction".

The combination of the foregoing apparatus elements are not disclosed or suggested by the prior art. It is this combination of apparatus elements that provides the unexpected improvements in the mat or nonwoven as demonstrated by the Pleyber Declaration.

In respect to the prior art teachings, it is initially noted that Vuillaume does not teach or suggest that the mat is free of prior consolidation as delivered to the first movable conveying element. In fact, Vuillaume teaches that a press roll (8) is used to "compact the assembly for the purpose of transferring it to the water-jet bonding unit, denoted by the genera; reference (9), which follows the production line." (See paragraph [0038].) "Optionally this compacting operation could be carried out by means of a rail of water injectors." (See paragraph [0039].)

Accordingly, Vuillaume does not contemplate or suggest the claimed apparatus, but rather, teaches away from the invention as set forth in claims 4 and 14. The claimed apparatus includes "a spun-bonding tower for depositing a mat on a first conveyor", a "transfer means to transfer the mat to a first movable conveying element for supporting the mat during consolidation, the mat being free of prior

consolidation". Vuillaume teaches consolidation on the conveyor that receives the web from the tower.

Noelle continues to teach away from the present invention in that his drum 20 pre-compresses and then continues to compress the cloth 10 during contact therewith and prior to transfer of the cloth. As noted by the patentee in column 4, line 39:

"Thus, the cloth 10, moving along the porous conveyor belt 1, is gradually compressed by being pinched between the conveyor belt 1 and rotating perforated cylindrical drum 20, both of which progress at the same linear speed."

Accordingly, even if the teachings of Vuillaume and Noelle are combined, the combination does not result in the claimed invention. Both of the references contemplate consolidation of the mat prior to transfer of the mat to a second conveyor.

Turning to the claimed permeability relationship, in the March 13, 2009 Office action, paragraph 9, the Examiner acknowledges the lack of an explicit prior art teaching and concludes such relationship would be obtained by optimization of a result effective variable in the absence of unexpected results. This is not a result effective variable since air permeability is not taught in the prior

art to control any nonwoven property. In any case, even assuming the claimed air permeability relationship to be a result effective variable and a proper rejection, the Pleyber Declaration provides a showing of unexpected results that overcomes such rejection as outlined in detail in the July 1, 2009 amendment.

Briefly, the Pleyber Declaration compares the properties of the mats resulting from the use of the claimed apparatus with those of a prior art apparatus. More particularly, Pleyber compares (1) the claimed apparatus wherein a higher permeability conveyor receives the spun filaments and consolidation occurs on a lower permeability conveying element with (2) a prior art apparatus wherein filament deposition and consolidation occur on the same conveyor, as in Vuillaume.

Pleyber shows the improved tensile ratio and tensile properties resulting from the use of the claimed apparatus. The declaration test results show that the high permeability conveyor suitable for receiving freshly spun filament inhibits effective consolidation by fluid impingement. Thus, applicant has discovered that the freshly spun mat prior to consolidation should be transferred to a lower permeability conveyor to improve filament entanglement and, in turn, to enhance the tensile

values achieved and the maintenance of the tensile ratio. In this manner, applicant has improved the apparatus by associating the consolidation means for initial fluid impingement with a lesser permeable support conveyor separate from the filament receiving conveyor.

In the Office action dated September 21, 2009, the air permeability limitation is not treated in detail and it is only argued that in Vuillaume:

"There is no explicit disclosure that the first movable element is highly air permeable, thus it can be established that the air permeability of the first movable element is less."

This is mere speculation and does not adequately address the limitation nor provide sufficient grounds for rejection of the claim. Vuillaume does not address permeabilities.

Vuillaume and Noelle provide no suggestion for their combination. The cited references are not directed to tensile ratio improvements and involve different objectives that do not suggest combination of their teachings.

Vuillaume discloses the production of a hybrid nonwoven comprising a web 4 of cellulosic fibers sandwiched between two webs 2, 7 of spun bonded fibers. Noelle discloses a preformed cloth 10 produced of card or cloth material. As shown in Fig. 1, the unsupported cloth 10 is deposited on

the conveyor belt 1. Placement of the cloth 10 without support indicates prior consolidation of the cloth enabling such transfer as confirmed at column 2, lines 56-61. Accordingly, the patents do not have common objectives, apparatus or mat constructions, and therefore, the combination of their teachings must be based upon applicant's own teachings.

Even assuming the teachings of the references are combined, the combination does not result in the claimed invention as discussed above.

For at least the foregoing reasons, the claims 4 and 14, together with the claims depending claims, are distinguished over the prior art.

In addition to the foregoing reasons, claims 7 and 8 set forth specific air permeabilities that favor a balanced tensile ratio as confirmed by the Pleyber Declaration. In the absence of a prior art teaching or suggestion of a relationship between air permeabilities and a balanced tensile ratio, the claimed values are not mere optimization of processing conditions. There is no corresponding objective cited in support of any relationship between the claimed air permeabilities and therefore no basis for optimization of these conveyor properties. In the absence

of a corresponding objective, optimization alleged in the action is based on applicant's own teachings.

The further rejection of claims 13 and 16 under 35 USC 103(a) as being unpatentable over Vuillaume in view of Noelle as applied to claims 4 and 15, and further in view of US patent 3,853,651 to Porte ("Porte") is in error for the same reasons as set forth above. Porte is cited in respect to the speed relationship and therefore does not remedy the above deficiencies of the rejection.

Porte "involves the use of a vibrating deflector surface upon which the polymeric filament is impinged, to produce in a simple way a spunbonded nonwoven textile fabric having an improved spread or width and improved homogeneity." (Patent col. 2, lines 27-32.) Thus, there is no relative speed teaching or suggestion pertinent to the claimed invention. Taken in context, it is clear that the citation at column 1, lines 8 - 25, relates to the cooperation of the deflector and the speed of one conveyor, not the relative speed between two conveyors. Porte never addresses the tensile ratio and no relationship between the Porte properties and the tensile ratio is disclosed or suggested.

For these additional reasons, claims 13 and 16 are further distinguished over the prior art.

For all of the foregoing reasons, it is submitted that the rejection of the claims is overcome and claims 4, 5, and 7-14 are in condition for allowance and such action is requested.

If there are any fees required by this Amendment, please charge the same to Deposit Account No. 16-0820, Order No. CAB-38032.

Respectfully submitted,

By: 
Joseph J. Corso, Reg. No. 25845

1801 East Ninth Street
Suite 1200
Cleveland, Ohio 44114-3108

(216) 579-1700

November 16, 2009